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A SYSTEM OF TOPIC CLASSIFICATION--CLASSROOM INTERACTION STUDY.

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DESCRIPTORS- *CLASSIFICATION, CONCEPT FORMATION, *CLASSROOM COMMUNICATION, DISCUSSION (TEACHING TECHNIQUE), EVALUATION TECHNIQUES, INTERACTION PROCESS ANALYSIS, SKILLS, *STUDENT TEACHER RELATIONSHIP, *TEACHING MODELS, *TEACHING STYLES, TEACHING TECHNIQUES,

DESIGNED FOR THE USE OF OBSERVERS, TEACHERS, AND RESEARCHERS IN DESCRIBING CLASSROOM BEHAVIOR, THIS MODEL WAS SET UP IN 3 DIMENSIONS--CONTENT-SKILLS, CONCEPT LEVEL (DATA, CONCEPT, GENERALIZATION), AND STYLE (FOCUSING ON DESCRIPTION, EXPANSION, EXPLANATION, EVALUATION-EXPLANATION, AND EVALUATION). SUBDIVIDING CLASSROOM DISCUSSIONS IS ACCOMPLISHED THROUGH TOPIC, TOPIC DIVISION, TOPIC FOCUS, THEME DEFINITION, SUMMARIES, AND TOPIC RETURNS. CLASSIFICATION OF TOPICS IS BY CONTENT-SKILLS AND LEVELS OF ABSTRACTION (DATA, CONCEPT, AND GENERALIZATION). DISCUSSION STYLE INCLUDES DESCRIPTION, EXPLANATION, EVALUATION-JUSTIFICATION, EVALUATION-MATCHING, AND EXPANSION. AUXILIARY CATEGORIES COVERED ARE MANAGEMENT, STRUCTURING, AND ACTIVITY. DISTINCTIONS BETWEEN STYLE CATEGORIES ARE MADE, AND A CODING SYSTEM FOR CLASSIFICATION OF TOPICS IS INCLUDED. (AF)

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INTRODUCTION -- BACKGROUND

It has long been recognized that how a subject is taught may be as important as what is taught. While the importance of the process of teaching or of education has been long recognized, it has only been in the last decade that systematic attempts to investigate the complex and sequential interactions of ideas presented in the classroom has gained real prominence. The combination of improved means for obtaining permanent recordings of classroom behavior and improved psychological and educational theory has provided the impetus for such investigators as Flanders (1963); Smith and Meux (1962); Spaulding (1963); Taba, Levine, and Elzey (1964); Gallagher, Aschner, et al. (1965); and others, to initiate methods of studying this complex social scene.

The purpose of this Topic Classification System is to provide a structure within which the interested observer, teacher or researcher, can describe present classroom behavior. Eventually it should provide a vehicle by which potential teacher modifications of behavior could systematically be introduced to study the influences of various teacher strategies. We reject categorically the notion that there is one effective teaching strategy. There is no "holy grail" in classroom interaction. What is good or effective is a function of the particular teacher, the particular group with its specific character, and perhaps the educational philosophy of the person making the judgment. As a roadmap tries to describe an area without making specific judgments on which might be a favorable destination, so this system attempts to chart the classroom performance without any one idea of teaching excellence in mind.

The very nature of creating some form of model does reflect, however, certain evaluative judgments of the creators. In this case, the three dimensional model seen below represents certain judgments regarding important dimensions to be observed and others to be dismissed in relation to the classroom.

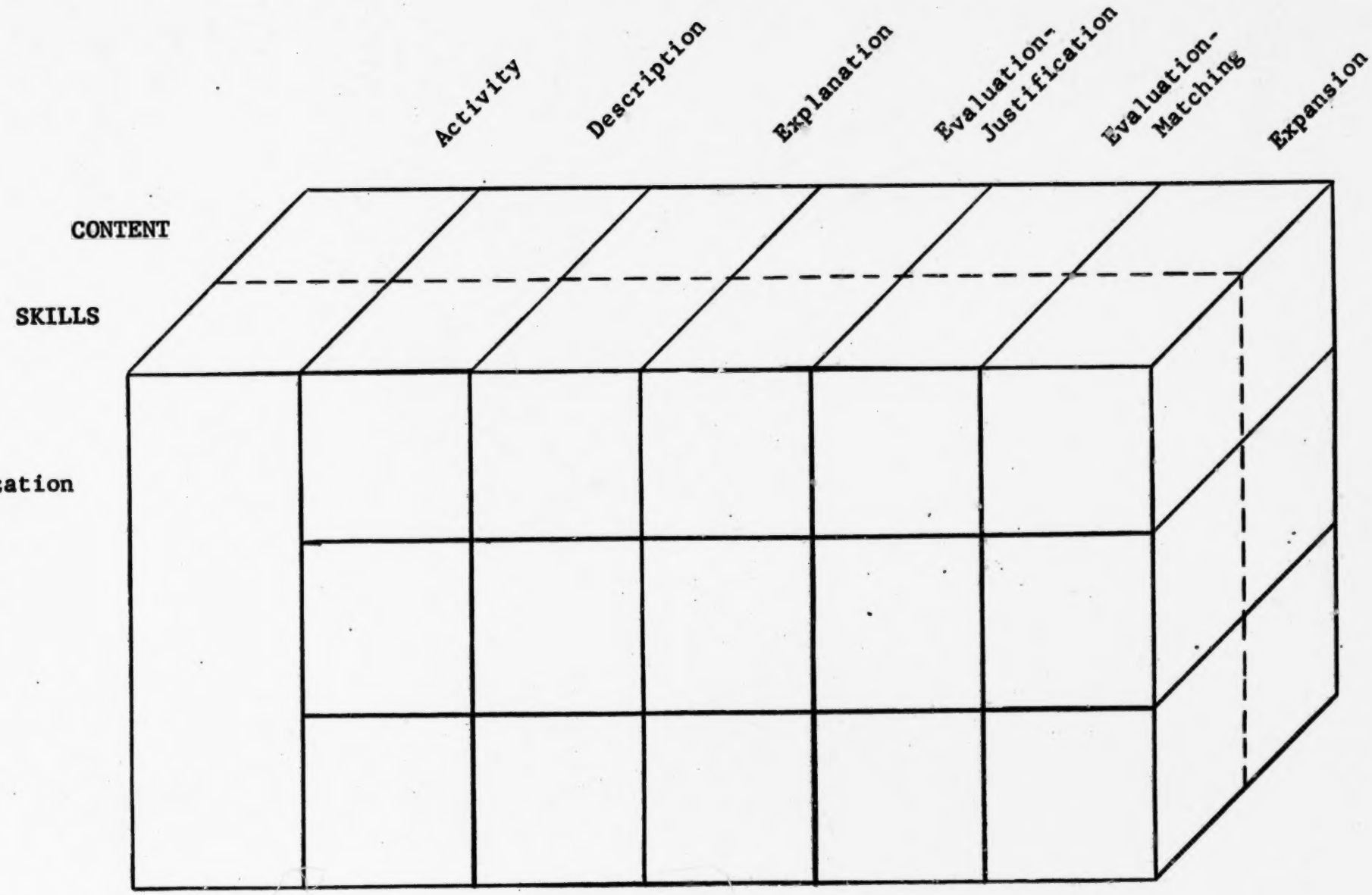
Possibly the most controversial decision was to limit our attention to the cognitive realm and not to try to delineate the affective realm. The creators of this system realize fully that the hopes, fears, and motives of the participants in any classroom influence the performance of the individual and the group. At the same time, the focus of classroom interaction is almost entirely related to the cognitive realm and it is in that sphere of activity that we have centered our own energies.

The Model and Its Dimensions

Content -- Skills. One of the dimensions perceived as important was that of CONTENT-SKILLS. This dichotomy refers to two manifest and distinctively different teaching goals. The first, CONTENT, refers to the goal of having the student learn a given body of knowledge. Information, ideas or concepts are presented directly to the student and he is expected to absorb them.

The second area, SKILLS, refers to the goal of teaching the student a set of behaviors or skills which will enable him to successfully master situations he will meet in the future. While these are commonly thought of in terms of teaching physical or motor skills in

Figure 1. Topic Classification Dimensions--Classroom Interaction Analysis



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shop or on the athletic field, it also refers to such things as reading skills, learning grammatical rules, certain mathematical operations, how to collect data, how to think and reason, etc. Such a distinction appeared to have definite relevance for differentiating teacher performance and style in various subject areas.

Concept Level. One of the weaknesses of previously constructed systems has been their reliance on content of affective dimensions without considering the level of conceptualization. Thus, teacher praise can be given for trivial or incorrect answers. Or a presumed teacher strategy for creative thinking can be presented on such a concrete and limited level that the presumed excellence of such teacher behavior can be seriously questioned. A full understanding of teacher style and its influence must, we feel, include the level of thought abstraction.

The three levels utilized here are crude and a deliberately limited view of the infinitely complex abstractional ladder. Nevertheless, we feel that they represent clearly recognizable and important teaching differentiations. DATA represents the discussion of specifics, the individual event or instance, the personal anecdote, the concrete level of happenings. CONCEPT represents the abstraction of data to general ideas and their applications or associations while GENERALIZATION represents the larger ideas or concepts in relationship to one another as in scientific laws or general principles of economics or history.

Style. This dimension deals with the mode of handling the discussion in the classroom. The focus is on a type of information processing in the larger sense of that term. The focus can be on DESCRIPTION, of the defining and describing aspects of a concept or happening; on EXPANSION which leads the group off in other lines of thinking or new associations; on EXPLANATION, or the attempts to present reasoned argument through sequential steps; on EVALUATION-EXPLANATION, or the attempts to judge and then explain the reasons for the judgment; or EVALUATION which applies criteria and judgment to the items under discussion.

It is possibly in this area that the teacher expresses his own individuality. It has been suggested that the emphasis on various styles also influences the student's own style of information processing.

SUBDIVIDING CLASSROOM DISCUSSIONS

I. Definition of Topic

Each investigator in the field of classroom interaction has felt the need to establish some units for the purposes of analysis. Sometimes these have been simply the individual statements of discussion participants and sometimes they have involved larger segments of classroom activities.

In this system the term topic is used to delineate a unit where the focus of classroom discussion centers on a given action, concept or principle. Classroom discussions do not necessarily follow orderly sequences. Therefore, the length of time spent on a subject under discussion determines its status as a topic rather than the place it might or might not hold in an orderly or logical sequence. A topic must consist of at least fifteen typewritten lines of script. Any fragment of a line is calculated as a "line" for this purpose. An interchange of less than that length is called an undeveloped topic since experience has shown it impossible to give a full classification to such units.

II. Topic Division

When a classroom discussion has been put into the form of a typewritten script, it may be divided into topics. Topic divisions are time divisions made in terms of subject under discussion. The average length of a topic would be one or two pages. The division is made in accordance with the structure of the classroom discussion rather than in accordance with an imposed, logical intellectual structure.

The procedure for topic division given below should ideally be carried out by two persons who would then reach consensus on their results. <u>The following points pertain to a script of about 50 to 60 minutes duration.</u> They can be extrapolated to apply to shorter or longer scripts.

1. The first step is to read through the script, drawing a line whenever there is a shift in focus of subject under discussion and, thus, a change in topic. Each of the topics set off in this manner must be given a brief name, summarizing its content.

<u>EXAMPLE</u>:

Topic F Sue: ...and so Rikki-Tikki-Tavi saved the day.

Topic G Teacher: Now that you've told us about what you've read from the collection of short stories, would someone like to tell us just what a short story is? How does it differ from a novel?

Topic F might be named: summary of "Rikki-Tikki-Tavi."

Topic G might be named: comparison of novel and short story.

An example of a form which may be used to record these divisions and topic names, as well as the later classification, follows.

2. When dividing a script into topics if the divider decides on a name for a topic while reading one page, he must be sure that the same name applies equally well to the topic on the following page or pages. It is most important to note what is actually under discussion and not be misled by what the teacher tries to elicit from the class, as the two may not be the same.

EXAMPLE:

Teacher: What are some of the problems that might face colonists from earth who wished to set up research laboratories on Mars?

Judy: Well, I think there are many other problems that have to be settled first. How are they going to get there? What will....

3. Topics are designated by the letters A, B, C, D, E, etc. in a given class session. Undeveloped topics are indicated by a lower case letter a, b, c, d, e, etc. It is possible for a topic to be interrupted and be returned to later in the class discussion. One test as to whether a return to a previous topic is being made is that it must be possible to give it an identical name and, later, an identical classification to the previous topic. A return to a topic is labeled with the same letter designation as the original A, B, C, etc.

Figure 2. Sample Listing of Topic Classification

Script: _____ Judge: _____

_____ Date: _____

Page	Topic Letter	Topic Name	Classification
1-3	A	Structuring	
3-4	B	students list life goals	
4	C	how to qualify for jobs	(undeveloped)
4-6	D	difference of goals of Ann & Jim	
6-7	E	Activity	
7-8	F	students list life goals	(a return)

4. The minimum length for a developed topic is 15 typewritten lines or script. Any shorter topic is undeveloped. An undeveloped topic must be labeled as SKILLS or CONTENT and may be classified as DATA, CONCEPT, or GENERALIZATION.

5. If the person making divisions finds a topic which extends beyond three pages of script he should become suspicious that he is not dividing properly. There will be very few topics that extend beyond three pages -- the average length is one to two pages.

6. There will generally be from 15 to 25 topics per script of 50 to 60 minutes in length.

7. If there is an undeveloped topic (less than 15 lines) which is preceded and followed by a topic which remains the same, that is to say, embedded within a developed topic (Example: Topic A -- Undeveloped Topic b -- back to Topic A) the situation will be handled in one of these ways: (See pg. 18 for discussion of CONTENT vs. SKILLS)

   a. The undeveloped topic will be ignored if it is a CONTENT topic embedded within a developed SKILLS topic.

   b. The undeveloped topic will be ignored if it is a SKILLS topic embedded within a developed SKILLS topic.

c. The undeveloped topic will be ignored if it is a CONTENT topic embedded within a developed CONTENT topic.

d. The undeveloped topic <u>will be divided off</u> if it is a SKILLS topic embedded within a developed CONTENT topic.

8. When an undeveloped topic is preceded by a developed topic and followed by a different developed topic (example: Topic A -- Undeveloped Topic b - Topic C) it is divided off from the other two. If, however, the divider can see a relationship between the undeveloped topic and one of the developed topics on either side of it he should merge it into the large topic.

9. When the divider is faced with a situation in which he is <u>uncertain</u> whether to have one rather long topic or two shorter topics, he should tend to divide the controversial section into the shorter topics.

10. Activity (defined on page 38) will be divided off when it consumes at least two minutes of class time and will be designated by a letter (A, B, C, etc.). It will be classified as CONTENT or SKILLS when possible, as well as being given the style classification of 6.

11. Management (defined on page 36) will be bracketed and included in the topic where it occurs.

EXAMPLE:

Teacher: O.K., now just as it takes skill to convey your message with pictures, it takes skill to convey a message with words. (Jean, would you close the window? I think we are all about to freeze.) Now later today some of you are going to talk about some of these pictures. What are some rules...

12. Structuring (defined on page 37) will be ignored unless it is at least 15 lines long. When it exceeds this minimum length, Structuring will be divided off as a topic is and given a letter designation. It will be classified as 007 but it will not be given a name.

13. Summaries (defined on page 17) will be treated as regular topics when they consist of at least 15 or more lines of typewritten script. If a summary is less than fifteen lines in length but more than five it will be underlined and left as a part of the topic in which it occurs. If it is less than five lines in length it will be ignored.

14. The following cues may be helpful in establishing the dividing points of topics.

    a. Sometimes, a word cue from the teacher indicates a shift in the discussion focus and hence in the topic, such as "O.K.", "Now", "Alright now", etc.

EXAMPLE:

Topic A Teacher: ...and when I bring this piece of fur close to the electroscope, the leaves spread./ Now, what causes the electroscope to work that way?

Topic B

b. There may be a brief summary by the teacher at the end of a topic.

EXAMPLE:

Topic H Teacher: Mercantilism, then, is an economic philosophy based on these principles: get possession of as many precious metals as you can, encourage industries which change raw materials into manufactured products that can be exported, and encourage a large population which will provide workers. All of this would lead to a favorable balance of trade./ Steve, you've been reading about the economics of more primitive areas of civilization. How does trade operate under these conditions?

Topic I

c. Topics often begin with a question by the teacher.

EXAMPLE:

Teacher: How would you define a parasite, Gerald?

or,

Teacher: Would you say that all streps are harmful? Why not Charles? You're shaking your head.

d. Topics are very often initiated and terminated by the teacher.

III. Topic Focus

During the process of topic division and topic naming the focus of the topic must be determined. The focus is the central idea which pervades a topic. It is often expressed by a few words which label the topic. Each time there is a shift in focus a new topic begins.

This central idea or focus must be derived from what is actually stated within the topic, not from inferences about what has been said. When the content of the entire topic has been considered, as well as the context in which it is found, the topic must be given a name. The topic name is a brief summary of what has been discussed, a summary which gives the central idea or focus. This topic naming is a crucial exercise for success in the later operation of topic classification is dependent on its having been done accurately and descriptively.

EXAMPLE:

(Topic A)

Teacher: Alright, an aerobe is what kind of bacteria? Can you answer that for us, Sue?

Sue: I can't explain what an aerobe is but an anerobe is a bacteria that can live in places where the air has been closed off.

Teacher: Right. They do not need free oxygen from the air but they use the combined oxygen that they find in what? Roger?

Roger: Inside the host.

Teacher: Yes, inside the host or the food on which they are growing. It might be the oxygen from a sugar or the oxygen from a fat or something like that but it's combined chemically. That is the distinctive feature of an anerobe./ Now, Topic B what about an aerobe? Let's get back to that. Sue, ...

A name which clearly and concisely indicates the focus of the above topic example might be "giving the main characteristics of an anerobe."

On the other hand, the above topic example might have been inaccurately named, "description of an aerobe" if based solely on the teacher's first attempt to set the focus. It must be remembered that the entire content of the topic must be weighed in determining focus and in the resultant naming.

When naming the topic example above it may have seemed that what they were really trying to say could best be summarized as "bacteria may potentially be found almost everywhere." This topic name is also inaccurate for the namer must never make inferences. Only that which is actually stated in the script must be considered.

IV. Theme Definition

A theme is a unifying element for a group of related topics. It represents a larger idea which encompasses series of topics. When the

script has been divided into topics and they have been named, themes are determined by looking for clusters of related topics. There are generally one to four themes per script of 50 to 60 minutes duration. There will be no undeveloped themes. Rather, there will be occasional topics in a script that do not fit under any theme. If a statement is made within the script which sets forth a theme this may be underlined. The final determination of the themes consensed in the same fashion as the topics. There may be some topics that do not fit under any of these themes. A topic unrelated to any theme, such as topics E and I in the example below, may occur at any point in a series of otherwise related topics. The determination of themes serves as an aid in perceiving a broader picture of the discussion patterns to be found in a particular class session. A theme must encompass at least three related topics.

EXAMPLE:

Theme--Great Men in the History of Bacteriology

Topic A--Van Leeuwenhock and the Microscope
Topic B--Jenner and Smallpox Vaccination
Topic C--Pasteur and Rabies Treatment
Topic D--Lister and Aseptic Surgery

Topic E--Listerine Antiseptic

Theme--Types of Bacteria and Diseases They Cause

Topic F--Clostridium tentani and Tetanus
Topic G--Clostridium botulism and Food Poisoning
Topic H--Antrax Caused by Spore Formers

Topic I--Careers in Bacteriology
(Does not fit under any theme.)

V. Summaries

When there is a Summary of the topic or theme under discussion such a Summary is underlined. If the topic is more than 15 lines long it is scored as a separate topic. If the passage is less than 15 lines long, it is underlined and included as part of the closest associated topic.

Exception: Occasionally a teacher will present a summary of the past work of the class at the very beginning of a class session. If 15 lines long, it is treated as just another topic, if less than 15 lines it is underlined and treated as an undeveloped topic.

VI. Topic Returns

When there is a return to a topic that has been previously introduced, it is labeled the same topic letter as the original introduction. Sometimes two undeveloped topics would combine to have the necessary length for a developed topic. In this case they are handled as noted below.

TOPIC	LABEL	CLASSIFICATION
e	The Seneca's Revenge	1 - 1 - 1
E F	Trade Policies in the Colonies	1 - 2 - 5
e	Return--The Seneca's Revenge	1 - 1 - 1

CLASSIFYING TOPICS

I. CONTENT-SKILLS Dimension

This dimension has been considered important because of two very different approaches to instruction -- one concentrating on knowledge and the other concentrating on giving students skills by which to seek or process knowledge.

A topic fits into the SKILLS category when the explicit intent of the lesson is to increase the student's skill in methodology of the subject matter and related areas or to create a set towards handling the data from a subject area; i.e., teaching the scientific method. Since most classroom activity has teaching this skill as one type of goal, the decision has to be made on the basis of the dominant aspect of the classroom interchange. All topics that would not fit into SKILLS are automatically CONTENT.

A. Identification of SKILLS

One of the following criteria should be present for a topic to be labeled SKILLS.

1. The student is being prepared to be a "doer".

   SKILLS: The description of a telescope and how it is used in an astronomy class before students make their own observations. (SKILLS-CONCEPT-DESCRIPTION)

   CONTENT: The description of Galileo's telescope in a class discussing his discoveries. (While one might make a case for long-range goals of skills, the dominant emphasis would be on content.) (CONTENT-DATA-DESCRIPTION)

IN THE CASE OF RULES 2 AND 3 BELOW, THE STUDENTS MUST BE EXPLICITLY INFORMED DURING THAT DAY'S CLASS SESSION THAT THEY WOULD BE EXPECTED TO PERFORM THESE SKILLS BEFORE THE TOPIC WOULD BE SO CATEGORIZED.

2. Teacher is demonstrating with clear intent that the students will be better doers from such observation.

SKILLS: The teacher shows class how to use spectroscope prior to the student use of tool in collecting own data.

The teacher shows how to outline an essay prior to student assignment of same task.

CONTENT: The teacher demonstrates concept of light waves and spectrum through use of spectroscope.

The teacher demonstrates outlining an essay with dominant theme of discussion on whether the essay has a summary and conclusions.

3. The focus of discussion is on <u>how</u> a student should study a given area rather than on the concepts related to that subject area.

<u>SKILLS</u>	<u>CONTENT</u>
A discussion on how one checks historical data for validity with emphasis on the student eventually doing it.	The class discusses whether Patric Henry really uttered his fateful words.
The class discusses how a scientist is expected to search in an area where few facts are now available.	The class discusses Freud and his methodology in trying to unravel mental illness.

SKILLS	CONTENT
A discussion centers on the various means of presenting data obtained from an experiment.	A curve relating temperature and pressure is examined to see what inferences can be drawn from the data.
Discussion of class is on how to read for critical evaluation.	Class is told to read critically the editorials in last night's paper.

II. Levels of Abstraction

One of the key determiners of utility and quality of classroom instruction is the level of abstraction at which the discussion is held. The most important idea can be met in a trivial fashion or the most innocuous set of data or experiences can be used to elevate the children's thinking. Three levels of abstraction have been chosen for use in this classification system as instructionally important. The division points, while arbitrary, have a certain rationale for study and training purposes.

A. DATA Level

These are topics where the focus of discussion is on specifics where a particular event, object, action or condition is considered. The emphasis is on things and people rather than abstract ideas. The student should be able to touch, see, hear, etc., the entities that are the focus of this type of topic.

EXAMPLES:

A description of one of Winston Churchill's brushes with Laborites in the House of Commons.

A story of how I trapped a skunk.

A teacher demonstrates how to interpret the colors on the classroom globe.

An argument over whether George Washington had false teeth or not.

A student explains how he developed the material for his report on Angola.

A descriptive report on the class play.

A discussion of the use of a tool or method in specific regard to a particular instance (as in an experiment or exercise in class).

DATA--Special Issues. Sometimes the specific instance is used only as an illustration with the focus on the topic being on a concept or generalization. If this is the case, then the topic is classified at the higher level, as in the examples below. However, the higher level CONCEPT or GENERALIZATION must be stated explicitly in the topic or it remains at the DATA level.

EXAMPLES:

Remember we have said the great men are often unappreciated in their own time--take Winston Churchill's treatment in the House of Commons.

A story of how I trapped a skunk which illustrates the larger concept of how humans outsmart animals.

B. CONCEPT Level

This type of topic focuses on ideas and classes of objects, events, processes, etc. It often deals with class inclusion or exclusion. Topic focus is thus on an abstraction, even though specifics may be used in the topic for illustration.

EXAMPLES:

Discussions which deal with the definition of virus, sales tax, social group, mammal, etc.

Explanations of the operation of a social group.

Discussions as to whether sales taxes are equitable.

Who belongs in the mammalian category.

How gasoline ignites.

CONCEPT--Special Issues. Many topics will discuss concepts that are known to be parts of larger systems. The stomach is part of the digestive system, the piston plays a part in the gasoline cycle, a legislative hearing is part of the process in obtaining a law. Nevertheless, if these systems' interrelationships are not made explicit or the larger ideas specifically presented, the discussion will be considered to be at the CONCEPT level.

Sometimes a class discussion will focus on a particular object representing a class of objects such as microscope or a short story. Although the discussion refers to this particular item, the focus of the discussion centers on the class of objects. Such a topic will be labeled CONCEPT.

C. GENERALIZATION Level

The differentiation between the CONCEPT and GENERALIZATION is difficult since the line to be drawn across many actual levels of abstraction is an arbitrary one. The following criteria are used to determine the presence of GENERALIZATION.

1. Two or more concepts are involved. The topic focus thus represents a complete sentence or a statement in a logical sense.

   EXAMPLES:

   Great men made history.

   Frustration breeds aggression.

   Water seeks its own level.

The presence of DATA in the topic focus (i.e., Thomas Jefferson was a great president.) automatically eliminates this topic from consideration as GENERALIZATION.

2. These concepts are interrelated either as a set of component parts in a system (i.e., the transportation system, the number system, the balance of trade, etc.) or as part of a larger generalization.

3. The topic focus in a GENERALIZATION is on a large idea having broad applicability. Another way of expressing this point is that the concepts making up the GENERALIZATION do not themselves have concrete referents. (i.e., War is Hell; As pressure increases, the volume of a gas decreases; Great novels deal with deep human emotions, etc.)

Each of these three criteria are necessary but not sufficient conditions for GENERALIZATION. All three must be present.

GENERALIZATION--Special Issues.

a. An emphasis on a piece of a system without focusing on the system itself would not be GENERALIZATION.

CONCEPT	GENERALIZATION
The nature of the presidency.	The balance of powers within the federal system.
A description of an electron.	The nuclear system -- electron, proton, neutron, etc.

b. A GENERALIZATION representing as it does high level mental functioning cannot be sustained for very long. A topic should be classified as GENERALIZATION if that high level is clearly reached, however briefly during the topic, and that GENERALIZATION can be considered as the topic focus.

EXAMPLE:

> In a discussion of seaports on the Atlantic Ocean someone remarks how important it is to be on a body of water since all major metropolitan areas are on or close to navigable water. (This GENERALIZATION would be the topic focus since what has preceded could clearly be subsumed under it even though it is a small part of the total topic.)

c. GENERALIZATION may be noted as appearing as an upward conceptual step in the discussion. One may move from the weather patterns of a specific region to weather systems in general, or from photosynthesis to energy transfer or from multiplication problems to a discussion of the changing of number bases.

d. If through explicit statement, an implication is drawn from a GENERALIZATION, it will be categorized on the GENERALIZATION level despite the lower conceptual focus involved. (i.e., If man is evil, then we need a larger police force in our town.)

EXAMPLES:

CONCEPT	GENERALIZATION
A discussion judging whether we are doing a good job in choosing a president.	If we accept the idea that Great Men Make History, what does this imply for our choice of a president?
Possible changes in future farming practices.	Population growth will continue to reduce the number of persons engaged in farming.

III. Discussion Style

The manner in which the topics are dealt with represent a potentially important aspect of teacher-student interaction and is the third major dimension in the system. In this dimension we can see the various thinking operations in action in classroom discussion.

A. DESCRIPTION

The focus of these topics is in describing, defining and, sometimes, in illustrating. The essence of the topic often answers, or tries to answer, the questions what, who, where, when. It is an attempt to draw boundaries around the set of actions, ideas, or entities under discussion.

Illustrations or specific examples are most often used as part of the descriptive material on an idea or incident. They often do not expand the set boundaries so much as they flesh out the existing boundaries by providing examples of set membership.

EXAMPLES:

DESCRIPTION DATA

A description of Lincoln's tomb not explicitly related to any concept or generalization.

Instructions on how to use a particularly idiosyncratic spectroscope prior to collecting data for an experiment. (Remember: Data topics almost always have concrete referents.)

DESCRIPTION CONCEPT

Discussion of the characteristics essential to the American provinces being called colonies.

Discussion of the definition of a simple machine.

DESCRIPTION GENERALIZATION

A discussion to the effect that the scientific method really represents a recognition of the fallibility of human perception and attempts to control for human bias as much as possible.

A discussion focusing on Newton's second law and its meaning.

B. EXPLANATION

This category is used when the focus of discussion is on a deductive sequence of thinking, where the end product or conclusion is an inevitable end product from the premises. In the classroom this is rarely presented in a classic or formal sense but can be recognized if the judge looks for the deductive reasoning. (Exception: Drawing a conclusion from a hypothetical example can be deductive reasoning but will be classified EXPANSION.)

EXAMPLES:

Discussion of the reason why Lincoln delayed issuance of The Emancipation Proclamation. (DATA-EXPLANATION)

Discussion of the sequence of steps needed in a good golf swing. (CONCEPT-EXPLANATION)

The students are performing experiments using an electroscope. Several students tell Jim step-by-step why his electroscope did not function properly when he used it. (DATA-EXPLANATION)

Explanation of what happens when photosynthesis occurs in a green leaf. (CONCEPT-EXPLANATION)

Considering the proposition that "Great men make history", the class discusses that one way to disprove the proposition is to find an ordinary man who made history. (GENERALIZATION-EXPLANATION)

Balancing a chemistry equation or calculating the answer to a mathematics problem. (DATA-EXPLANATION)

C. EVALUATION-JUSTIFICATION

This category is used when a judgment or decision is made and justified. The criteria used for the judgment are implicit. The judgments or decisions are made by individuals on the basis of individual or unstated standards. The decision can be along the dimensions of truth-untruth, good-bad, important-unimportant, correct-incorrect, etc. The key factor is not the dimension being asked for but that a decision or choice must be made that excludes all other choices. A probability statement or request (i.e., The chances are high that America will retain its influence in Asia.) fits this definition of evaluation.

EXAMPLES:

The students discuss that photosynthesis is very important to mankind and why.

The class decides they should have a student council and discusses the reasons for this decision.

The class discusses the problem of Red China and the U. N. They take the stand that Red China should be admitted to the U. N. and justify this stand.

A student spends some time telling why he likes abstract art.

The best method for cracking petroleum and the reason why this method is best is discussed.

D. EVALUATION-MATCHING

This category is used when there is a judgmental question or decision and criteria are explicit. The discussion is focused on

matching events or instances to criteria. The act of categorization, provided the criteria for the categories are made explicit is also considered evaluation-matching. As above, the criteria may deal with factual matter or qualitative judgment. The key element is the request or statement matching ideas or instances to a set of criteria.

EXAMPLES:

A class judges their own school building in terms of criteria for good fire prevention and defend their judgment.

Having previously established rules for a good book report, the class now compares whether a book report given matches up.

Jones is a good mayor because he meets the criteria we established for the position -- honest, intelligent, sensitive, etc.

In view of the evidence we have collected, what do you say now regarding the validity of the law, "Water seeks its own level."

The class takes a portion of their categories of the needs of a family (food, clothing, transportation, recreation, etc.) and decides which ones are supplied by a bicycle, an extension cord, etc.

Is an amoeba an animal when it is compared against the dictionary definition of animal?

E. EXPANSION

The focus of these topics lie in a distinct shift or broadening or amplification in the subject matter under consideration. It broadens the scope of the subject through additional associations of concepts or ideas. This may be done through:

1. Comparison or contrast of topic with other concepts or the application of ideas to a new and different problem.

EXAMPLES:

Drawing comparison of light waves with sound waves.

Contrasting religious influence in government during the tenth and twentieth centuries.

If hunger makes men aggressive, then peace may depend more on farmers than upon diplomats.

2. Presenting a hypothetical set of circumstances and being asked to project an implication or supposed result.

EXAMPLES:

What might happen if all electricity went off in central Illinois?

If women had had suffrage during the Revolutionary Period, how might things have been different?

3. When discussion moves from one medium of expression to another in dealing with the same subject matter.

EXAMPLES:

We have talked about the political divisions in South America, let's look at the globe and see if we can find climatic and elevation information as well.

Moving from a semantic discussion of a mathematics problem to a drawing or symbolization of the problem on the blackboard.

Special Rule: When there is a comparison or contrast between two generalizations or concepts or things within a topic, there also may be evaluation and explanation present. Nevertheless EXPANSION will take precedence in such a case!

EXAMPLES:

Comparing Jackson and Jefferson as strong presidents.

Discussing the relative efficiency of two different methods of petroleum refining.

LEVELS AND STYLE EXAMPLES
IN THE CONTENT DIMENSION

	DATA	CONCEPT	GENERALIZATION
DESCRIPTION	A detailed description of the Pilgrim's journey.	The American Colonies' trading policies with the mother country.	In all colonial relations, the mother country exploits the resources of the colony.
EXPLANATION	Explaining why the Pilgrims felt they had to leave England.	Showing the sequence of events by which the goods were exchanged.	How would this rule apply to the Philippine Island?
EVALUATION JUSTIFICATION	Were the Pilgrims justified in leaving England? Why?	Which of the mother countries had the most lenient policies toward their colonies? Why?	A discussion generated by the question, "Do you think anybody enjoys Communism?" Communism, as a system of government, is discussed in explaining the individual's opinion.
EVALUATION MATCHING	Discussion of whether Hemingway's short story, The Snows of Kilimanjaro is a good short story as matched with the characteristics of a good short story given in the textbook.	Is ESP a proper study for psychology? Using criteria for psychology as a science for judgment?	Is the public transportation system in a given city adequate for the needs of the people as they are exemplified by a survey of traffic flow?
EXPANSION	Suppose the Pilgrims had landed in Virginia what might have happened?	Comparing trade policies of colonia days and today.	Predict our trade relationships with our Martian colonies.

LEVELS AND STYLE EXAMPLES
IN THE SKILLS DIMENSION

	DATA	CONCEPT
DESCRIPTION	Discussion concerning the organization of a new social studies textbook prior to the students' use of the book.	The description of a telescope and how it is used in an astronomy class before students make their own observations.
EXPLANATION	Information on how to use a particular golf club that has some idiosyncracies to it.	The teacher or class discusses how one checks historical data with emphasis on the student eventually doing it.
EVALUATION JUSTIFICATION	Before a chess game, a student states his opinion that Chess Ideas for Young Players is the best book he has seen on chess and tells why he believes this.	The class decides which of two sets of encyclopedias are best in supplying information for reports and justify their choice. The students then begin to prepare reports.
EVALUATION MATCHING	Students criticize reports from a recent field trip with criteria previously developed.	Before beginning a series of experiments, the class discusses whether the melting point should be recorded at the beginning or end of the process.
EXPANSION	The class compares two globes in the classroom on how the interpretation of data must differ for each.	The class discusses the various possible ways they might express data in a sociological experiment.

EXAMPLES OF GENERALIZATION IN THE SKILLS DIMENSION

GENERALIZATION

DESCRIPTION	The teacher defines the scientific method as a means of testing hypotheses prior to the students' beginning such testing.
EXPLANATION	Teacher explains how the scientific method the students are learning enables knowledge to grow and expand.
EVALUATION JUSTIFICATION	A student tells why he objects to the Palmer Method of Handwriting immediately before a writing lesson.
EVALUATION MATCHING	The students discuss how they can use criteria to evaluate the appropriateness of various decisions in the political arena.
EXPANSION	The class compares the Socratic method to the scientific method to see how the different systems agree and differ with a view towards which approach the students should take.

IV. Auxiliary Categories

There are a number of auxiliary categories which do not fit into the general scheme or model but which are necessary components of classroom behavior. A brief description of these follows.

A. Management (Not Coded)

The essence of Management activity is that it concentrates on arranging the environment for learning. This is done through quieting the class, arranging the temperature or seating arrangements, taking attendance, giving dates for assignments, etc. Included in Management is incidental verbal byplay between students, or teacher and students, often occurring at the beginning of the class session before the class actually gets down to business. Segments of a topic that are rated Management are bracketed and not included in any quantification of that topic.

EXAMPLES:

Teacher discusses a popular TV show unrelated to lesson with a few students while waiting for class to settle down.

Announcement comes on the school public address system about the Senior Prom in the middle of class and there is some resultant verbal byplay.

An argument arises about the accuracy of the TV weather forecaster.

There is trouble finding the erasers and the class is delayed in starting.

B. Structuring (Coded 007)

This type of activity deals directly with the process of sequence of the class activities that are content oriented. It is the engineering phase of the class discussion determining what the class is going to do next or what they might do tomorrow.

In any particular topic there are present a large number of possible alternatives which represent the next move in the sequence. The discussions which revolve around what should be the next move or how this next move should be accomplished, is structuring unless explicit mention is made that the students are expected to learn this sequence of activities as part of the lesson, in which case it would be categorized SKILLS.

Since this is an integral part of any class operation, it is taken note of only if it reaches 15 lines in length!

EXAMPLES:

> Students are getting ready to write a short essay in class and the teacher gives lengthy instructions on precisely how it will be done.
>
> Students are about to role play and the scene is set for them by the teacher and other students.

Some structuring often occurs at the beginning and end of class sessions. If these are not 15 lines in length, they are merely ignored and considered a part of the associated topic. If there is no associated topic then it is ignored and not counted as part of any topic.

C. Activity (Coded 106 or 206)

This category is used when there is a period where students are actively engaged in some Activity such as carrying out a research project, doing math exercises, role playing, or extracting topic sentences during class time. This Activity should last for at least two minutes to be classified. This would bring it in line with the average length of other topics where verbal interchange is the focus of action. In this situation, there are likely to be more individual conversations. The group discussion pattern may be abandoned or deferred for a set period of time. Whether Activity is classified as SKILLS (206) or CONTENT (106) depends on how thoroughly the Activity has been identified as part of a deliberate intent to increase the skills competencies of the student. Since there is often little conversation in an Activity topic, the context of the theme should determine which of the two it should be.

EXAMPLES:

Teacher gives explicit indication that conducting an experiment will aid the students in becoming better scientists (Activity-SKILLS).

Teacher uses student data collected by experiment to make a specific point (Activity-CONTENT).

The following examples indicate the differences between auxiliary categories.

Management	Structuring	Activity
Class seating arrangement is being changed to prepare for watching closed circuit TV program.	Teacher gives extended directions on what they are to watch for the TV program.	The observation period where the students the TV program.
Students are asked to get equipment ready for experiment they will conduct.	The teacher explains which equipment is to be used in collecting data.	The class members are actually conducting the experiment.
Class is asked to get out themes that they had been working on.	Teacher gives instructions on the way in which the themes will be treated in this session.	Students work quietly at desk in individual critique of themes.

Coding System for Classification of Topics

The code is a three (3) digit number to correspond to the three dimensions of the classification system.

The first division is between CONTENT and SKILL and this would be classified and coded in hundreds' column. The second is the level of conceptualization and this would be coded in the tens' column and the third is style which would be in the ones' column.

The codes are

1 - CONTENT
2 - SKILLS

0 - No determinable level (undeveloped topic)
1 - DATA
2 - CONCEPT
3 - GENERALIZATION

0 - No determinable style (undeveloped topic)
1 - DESCRIPTION
2 - EXPLANATION
3 - EVALUATION-JUSTIFICATION
4 - EVALUATION-MATCHING
5 - EXPANSION
6 - Activity
7 - Structuring

EXAMPLES:

A CONTENT topic at the CONCEPT level and in the EXPANSION style would be coded 125.

An undeveloped skills topic at the DATA level would be 210 -- if the level could not be determined it would be 200.

A topic on Structuring is called 007.

An Activity topic is coded 106 (content) or 206 (skills).

V. Distinctions between Style Categories.

A. DESCRIPTION vs EXPLANATION

When the topic focus centers on the description of a function or process such as the nitrogent cycle, distillation of gasoline or a golf swing, there is a question or distinguishing DESCRIPTION from EXPLANATION. The crucial differentiating factor is whether the functions or processes are merely listed (DESCRIPTION) or whether a sequence of interacting steps is provided (EXPLANATION).

EXAMPLES:

DESCRIPTION	EXPLANATION
Listing the causes of World War I.	Suggesting causal relationships for World War I.
The components of the digestive system.	Describing the digestive system with emphasis on interrelating parts.

B. DESCRIPTION vs EVALUATION-MATCHING

The point of greatest similarity between these two categories comes when criteria which will provide a basis for judgment are discussed. When there is a mere listing of the criteria this is DESCRIPTION but when there is an actual matching operation taking place then this is EVALUATION-MATCHING.

EXAMPLES:

DESCRIPTION	EVALUATION-MATCHING
The characteristics of a good leader.	The determination whether Mr. X meets that criteria.

The determination of the criteria for a relevant experiment.	The categorization of a series of experiments into relevant and irrelevant.

C. EVALUATION-JUSTIFICATION vs EXPLANATION

In both of the above categories the topic focus is on rational arguments or justifications. In EVALUATION-JUSTIFICATION there is, in addition, a decision or judgment that is an important part of the topic focus.

EXAMPLES:

EVALUATION-JUSTIFICATION	EXPLANATION
Lincoln was a great president because...	The reason why Lincoln was a great president...
The chances are slim that Mr. Johnson will win the election because of his civil rights attitudes.	Why Mr. Johnson will not be elected.
Estimation of an answer from several given alternatives.	The calculation of the answer to a problem.

D. EVALUATION-JUSTIFICATION vs EXPANSION

Since EXPANSION represents a broadening of the points under discussion it takes precedence over other categories if one of the three criteria for its existence are satisfied.

1. A comparison of two equal (on an abstraction level) entities.
2. A hypothetical or make believe example.

3. A change from one medium of expression to another (as in semantic to symbolic).

EXAMPLES:

EVALUATION-JUSTIFICATION	EXPANSION
Giving and justifying an opinion on Grecian art.	Comparing the artistic merits of Greece and Rome.
Estimating the possibilities of NATO disbanding.	What might happen if NATO would disband.
Discussion of the correctness or incorrectness of the formula.	The translation of a chemical or mathematical formula to linguistic terms.

E. DESCRIPTION vs EXPANSION

The point of greatest issue between these two categories is when concepts are being interrelated. If the emphasis is on the system of which the relationship is a part then it is a DESCRIPTION of the system. If it is a comparison of two components of the system then it is EXPANSION.

EXAMPLES:

DESCRIPTION	EXPANSION
The transportation system of New York City.	A comparison of bus and subway service in New York.
A motivational theory including anxiety and hostility.	A comparison of anxiety and hostility as human motivation concepts.

INDEX

ACTIVITY
definition, 38
examples of, 38,39
rules for topic division, 11

AUXILIARY CATEGORIES, 36-39

CLASSROOM INTERACTION
need for study, 1-2

CODING SYSTEM
for topics, 40
examples, 40

CONCEPT
criteria for, 22
distinguish from DATA, 23, 27, 33-35
distinguish from GENERALIZATION, 23, 28, 33-35
examples of, 22, 33-34
special issues, 23

CONTENT
definition of, 18-20
distinguished from SKILLS, 18-20
examples of, 18-20, 33

CONTENT-SKILLS DIMENSION, 18-20

DATA
criteria for, 21
distinguish from CONCEPT, 23, 27, 33-34
examples of, 21-22, 33-34
special issues, 22

DESCRIPTION
definition of, 27
distinction from EVALUATION, 41, 42
distinction from EXPANSION, 43
distinction from EXPLANATION, 41
examples of, 27-28, 33-35, 41-43

EVALUATION-JUSTIFICATION
definition of, 29
distinction from EXPANSION, 42-43
examples of, 29, 33-34, 42-43

EVALUATION-MATCHING
definition of, 29-30
distinction from DESCRIPTION, 41-42
examples of, 30, 33-35

EXPANSION
distinguish from EVALUATION-JUSTIFICATION, 42-43
distinguish from EVALUATION-MATCHING, 32
distinguish from DESCRIPTION, 43
examples of, 31-32, 33-35

EXPLANATION
definition of, 28
distinction from DESCRIPTION, 41
examples of, 28, 33-35
related to EXPANSION, 28

GENERALIZATION
criteria for, 23-24
distinguish from CONCEPT, 24, 26, 28, 33-35
distinguish from DATA, 24, 33-35
examples of, 23-25
special issues, 24-26

LEVELS OF ABSTRACTION, 21-26

MANAGEMENT
definition of, 36
examples of, 36, 39
rules for topic division, 11-12

MODEL
examples of categories, 33-35
figure of, 3
overview, 2-5

SKILLS
definition of, 18-20
distinguished from CONTENT, 18-20
examples of, 18-20, 34-35

STRUCTURING
coding of, 12
definition of, 37
examples of, 37, 39
topic division of, 12

STYLE DISTINCTIONS, 41-43

SUBDIVISIONS OF DISCUSSION, 6

SUMMARIES
how treated, 17
topic division, 13

SYSTEMS IN GENERALIZATION, 23-24

THEME
definition of, 15-16
examples of, 16

TIME
factor in topic division, 6, 10

TOPIC
definition of, 6
embedded, rules for, 10-11
labeling of, 8, 14-15
length of, 10
rules for return to, 8, 17
sample coding sheet, 9

TOPIC DIVISION
criteria for, 6-14
examples of, 7, 8, 13

TOPIC FOCUS
criteria, 14
examples, 14-15

TOPIC -- UNDEVELOPED
criteria, 10
merging with other topics, 11
special cases, 10-11

TRANSFORMATION
from one content area to another, 31-32